

Notice of Allowability

Application No.

10/663,567

Examiner

Rip A. Lee

Applicant(s)

WU ET AL

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to October 3, 2005.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Gary P. Katz on October 14, 2005.

Claim 1, line 9 replace "copolymer" with "polymer"

Cancel claims 10-14

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1-9 are allowed over the closest references cited below.

The present invention is drawn to a method for forming an ethylene-alpha olefin polymer comprising: (a) polymerizing an olefin feed containing ethylene and at least one alpha olefin in the presence of a metallocene catalyst system under conditions sufficient to produce a liquid polymer, (b) isomerizing the liquid polymer in the substantial absence of molecular hydrogen and in the presence of an acidic isomerization catalyst to produce an isomerized liquid polymer, and (c) hydrogenating the isomerized liquid polymer in the presence of a hydrogenation catalyst to produce an ethylene-alpha olefin polymer suitable for use as a lubricant base oil.

Wu *et al.* (U.S. Patent 6,660,894) teaches a process of upgrading a polyolefin product by preparing a polymer of ethylene and propylene using the metallocene based catalyst, followed by contacting the product with a first solid material comprising a hydrogenation catalyst, and subsequently contacting the hydrogenated product with a second solid material comprising an isomerization catalyst. Both hydrogenation and isomerization occur in the same vessel, and the hydrogen gas is not removed during the isomerization step. The inventors also provide for an alternative method which involves subjecting the polyolefin product to isomerization prior to hydrogenation, and this would appear to be similar to the process of the instant claims. However, it is the examiner's conclusion that this alternative manipulation would not afford a process in which isomerization occurs in the substantial absence of hydrogen because the process described in Wu *et al.* would still occur in the same vessel, and there would be no provision for removal of hydrogen from the reaction system. Therefore, the process of the instant claims is distinct from that suggested by the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure. The following references have been cited to show the state of the art with respect to processes involving upgrading liquid olefin products.

Heilman *et al.* (U.S. 6,124,513) teaches a process of polymerizing ethylene and alpha olefin in the presence of a metallocene-based catalyst. The product is further hydrogenated and hydroisomerized in the presence of suitable catalysts. Hydroisomerization requires hydrogen gas.

Bagheri *et al.* (U.S. 6,548,723) discloses a process in which a C₁₀ olefin is dimerized in the presence of a metallocene catalyst. The dimer is further reacted in the presence of acidic catalyst and monomer to produce oligomer, and the resulting oligomer is hydrogenated.

Song *et al.* (U.S. 2003/0055184) discloses a process for preparing polyalpha olefin oligomers in the presence of single site catalysts. The products are further hydrogenated and used for lubricant components.

Ho *et al.* (U.S. 4,967,032) teaches a process of contacting a polyalpha olefin product with an isomerization catalyst and subsequently, with a hydrogenation catalyst to afford lubricant base oils. The polyalpha olefin is prepared with a Ziegler Natta catalyst rather than a metallocene catalyst.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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October 14, 2005



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